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## **Transcending capitalism growth strategies for biodiversity conservation**

### **Abstract**

The unlimited economic growth that fuels capitalism's metabolism has profoundly transformed a large portion of Earth. The resulting environmental destruction has led to an unprecedented rate of biodiversity loss. Following large-scale losses of habitats and species, it was recognized that biodiversity is crucial to maintaining functional ecosystems. We sought to continue the debate on the contradictions between economic growth and biodiversity in the conservation science literature and thus invite scholars to engage in reversing the biodiversity crisis through attending the impacts of economic growth. In the 1970s a global agenda was set to develop different milestones related to sustainable development, including green-blue economic growth, which despite not specifically addressing biodiversity reinforced the idea that economic development based on profit is compatible with the planet's ecology. Only after biodiversity loss captured the attention of environmental sciences researchers in the early 2000s was a global biodiversity agenda implemented. The agenda highlights biodiversity conservation as a major international challenge and recognizes that the main drivers of biodiversity loss derive from economic activities. The post-2000 biodiversity agendas, including the 2030 Agenda for Sustainable Development and the post-2020 Convention on Biological Diversity Global Strategy Framework, do not consider the negative impacts of growth-oriented strategies on biodiversity. As a result, global biodiversity conservation priorities are governed by the economic value of biodiversity and its assumed contribution to people's welfare. A large body of empirical evidence shows that unlimited economic growth is the main driver of biodiversity loss in the Anthropocene; thus, we strongly argue for sustainable degrowth and a fundamental shift in societal values. An equitable downscaling of the physical economy can improve ecological conditions thus reducing biodiversity loss and consequently enhancing human well-being.

## Introduction

Capitalism's socioeconomic metabolism (i.e., the flows of materials and energy need to move human societies) is founded on ever-expanding economic growth (de Sabata 1995). In the 20<sup>th</sup> century, the physical economy grew faster than the population and the materials used per unit of global land area per year increased by 900% (Krausmann et al. 2009). During the first years of the 21<sup>st</sup> century, material extraction continued to accelerate (Schandl et al. 2018), causing a 53% increase in the physical economy by 2015 (Krausmann et al. 2018). If growth is sustained at a yearly rate of 3.3%, the global physical economy will increase 16-fold by the early 22<sup>nd</sup> century (Sage 2020).

Continual growth drives industrial expansion and accelerates communications and trade dynamics, resulting in overconsumption of materials and energy, conversion of large portions of land for human use, and an unsustainable increase in waste and emissions (Smil 2013; Krausmann et al. 2018). Consumption and production patterns that fuel growth are responsible for the environmental degradation in the Anthropocene (Hussain & Haque 2019; Sol 2019) and have led to large increases in greenhouse gas (GHG) emissions and climate change (Krausmann et al. 2009; Schandl et al. 2018), a profound transformation of the planet (SCBD 2014, p.141; IPBES 2018, p.190), and huge negative impacts on biodiversity (Ellis 2011; Wilson et al. 2016; Díaz et al. 2019). Biodiversity loss and climate change are closely interconnected; they share common drivers (human activities) and have predominantly negative impacts on human well-being and quality of life (IPBES-IPCC 2021).

While science and governmental policies have long strived for biological diversity protection, biodiversity has continuously declined (Mace et al. 2018). Ecosystems are deteriorating at unprecedented rates and approximately 1 million species are in danger of extinction (IPBES 2019). The last UN report, *Global Biodiversity Outlook 5*, concludes that, as in the case of the 2010 biodiversity targets, the 2020 Aichi Targets have not been met (SCBD 2020). The spiraling biodiversity loss will have multiple and multidimensional cascading effects that will lead to drastic changes in ecosystems dynamics and functioning (Cardinale et al. 2012; Hooper et al. 2012; Gonzalez et al. 2020). The growth-driven biodiversity collapse (McCauley et al. 2015; Young et al. 2016; Ceballos et al. 2017) over the past century is causing the loss of ecological interactions, functions, redundancy, codependencies, structural complexity, and mechanisms of resilience that characterize

natural systems (Díaz et al. 2019; Sage 2020). The COVID-19 crisis not only demonstrates the fragility of the current socioeconomic system unaligned with nature (Baldwin & Weder di Mauro 2020) but also has resulted in the shutdown of conservation programs reliant on ecotourism for funding, which will also affect biodiversity protection (Fletcher et al. 2020; Corlett et al. 2020). This is strong evidence of the dependence of conservation funding on economic growth (Sandbrook et al. 2020).

Facing the global challenge of biodiversity loss will require making planned decisions (Büscher et al. 2017a) and adopting fairer (Wyborn et al. 2020) and more effective approaches to biodiversity conservation aimed at transcending the actual economic growth paradigm. We sought to provide a comprehensive, evidence-based description of the true relationship between growth and biodiversity. We critically examined the role of growth in international biodiversity and sustainability agreements, a timely issue in the post-2020 Global Biodiversity Framework (post-2020 GBF) developed under the auspices of the Convention on Biological Diversity (CBD). Unlike in political ecology and ecological economics, reviewing the implications of growth on biodiversity is uncommon in the conservation science literature (but see Dietz & Adger [2003] and Otero et al. [2020]). Accordingly, and by emphasizing the need to design degrowth strategies, we sought to stimulate further debate among conservationists on the contradictions between growth and biodiversity.

### **Growth-driven Biodiversity Loss**

The sustainability literature usually considers economic growth, measured through gross domestic product (GDP), essential to moving toward a healthier planet and protection of biodiversity (WCED 1987). Growth in GDP is said to promote technological efficiency while reducing the use of materials and energy and GHG emissions (Victor 2010). Accordingly, decoupling of GDP from environmental and biodiversity impacts (Haberl et al. 2020; Wiedenhofer et al. 2020), or reducing such impacts while the economy is growing, is viewed as possible (Ward et al. 2016). However, so far dematerialization has been achieved almost exclusively through extraction of materials offshore and by only a few developed countries (Wiedmann et al. 2015). Additionally, any environmental and biodiversity improvements derived from efficiency gains have been generally cancelled by the

“rebound effect” because such gains have further stimulated growth and hence materials and energy use (Schandl et al. 2018).

Recent publications show impacts on biodiversity from an ever-expanding growth fuelled by continuous and intensive resource extraction. Encroachment and fragmentation of habitats; biotic homogenization ; alteration of trophic structures; changes in species’ ranges and population sizes; and increases in invasive non-native species and local extinctions are examples of such impacts (Czech 2000, 2008, Limburg et al. 2011; Czech et al. 2012; Otero et al. 2020). Expansion of intensive agriculture, forestry, fisheries, aquaculture, industry, urbanization, and transport also affect biodiversity by altering terrestrial, freshwater, and marine ecosystems (Czech et al. 2004; Sala & Knowlton 2006; Weinzettel et al 2013; Newbold et al. 2015; Froehlich et al 2018; Powers & Jetz 2019; Albert et al. 2021). Some authors have theoretically analyzed the relationship between growth and biodiversity loss (e.g., Czech 2000, Czech et al. 2004), whereas others provide empirical evidence of it (e.g., Limburg et al. 2011, Czech et al. 2012, Weinzettel et al 2013). For instance, Clausen and York (2008a) show how mean trophic level of marine catch decreases in nations with continuous economic expansion, urbanization, and population growth. Although in the earliest stages of economic development the mean trophic level of marine catches increases, further growth leads to a decline of species at high trophic levels and an overall ecosystem decline once GDP per capita and urbanization reach US\$700 and 23%, respectively. DeFries et al. (2010) found a positive correlation between forest loss and urban growth and agricultural exports that continuously exacerbated forest clearance, particularly in the tropics. Estrada et al. (2017) found that 60% of primate species are threatened by extinction and 75% are in decline as a result of habitat loss through the expansion of industrial agriculture, large-scale cattle ranching, logging, oil and gas drilling, mining, dam building, and road construction. Marques et al. (2019) report industrial agriculture and forestry are major drivers of bird species loss; anthropogenic land use is responsible for up to 7% of this loss and a rise in the international goods trade is responsible for an additional 25% of bird biodiversity impacts. Results of several other studies also demonstrate that numbers of threatened plant, amphibian, invertebrate, fish, and reptile species increase with economic growth (Czech and Krausman 1997; Naidoo & Adamowicz 2001; Clausen & York 2008b).

## **Deficiencies of Growth-oriented Environmental and Biodiversity Agendas**

The 1972 UN Conference on the Human Environment was the first to set goals for a global sustainability agenda. The agenda suggests reconsideration of the motives of growth due to their environmental impacts. Subsequently, four additional UN conferences were organized to establish environmental and socioeconomic milestones of growth-oriented sustainable development in 1982, 1992, 2002, and 2012. The shift in the focus of growth-centered sustainable policies between the 1972 and the four subsequent conferences was in response to the interests of the status quo defenders in reconciling growth with environmental conservation at a time of increased ecological degradation (Gómez-Baggethun & Naredo 2015).

The sustainable development inherent idea that continued economic expansion is compatible with planetary limitations was formalized at the 2012 UN Conference through the concept of “green-blue economic growth” (GBEG) (Eikeset et al. 2018; Hickel & Kallis 2020). The GBEG pursues climate-change mitigation and nature conservation and restoration through economic growth and profit. The GBEG is governed by conventional economics principles, striving to measure nature’s monetary value and linking it to the mainstream concepts of natural capital, sustainable development, and ecosystem services (Gómez-Baggethun et al. 2010; Loiseau et al. 2016). The GBEG concept dominates the international sustainability agenda, including the European proposal for a “Green New Deal,” which advocates application of GBEG to cope with the social consequences of the 2008 financial crash and ecological breakdown (Schneider et al. 2010). However, current trends in biodiversity decline show that GBEG is, like sustainable development, another oxymoron that combines contradictory interests and strategies in the pursuit of legitimacy (Brand 2012).

In 2015 UN Member States adopted the 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals (SDGs), which set the blueprint for achieving global development while protecting the environment (UN 2015). In the 2030 Agenda there are two biodiversity-focused SDGs: conservation and sustainable use of the oceans, seas, and marine resources (SDG 14) and sustainable management of forests to combat desertification and land degradation and halt biodiversity loss (SDG 15). These goals urge taking significant action to reduce the degradation of natural areas, halt biodiversity loss, and protect and prevent species extinction. Nevertheless, SDGs do

not entail monitoring absolute trends in resource use and prioritize growth (e.g. SDG 8) over ecological integrity (Eisenmenger et al. 2020).

In line with international environmental policy, the global biodiversity agenda, initiated in the 2000s in the conservation literature (Karlsson-Vinkhuyzen et al. 2017), also builds on growth-based sustainable development principles. While the CBD 2010 biodiversity targets, seeking to significantly reduce biodiversity loss by 2010, argue for integration of biodiversity management plans in economic planning (SCBD 2005), the main principles of CDB Strategic Plan for Biodiversity 2011–2020 and the 2020 Aichi Biodiversity Targets were based on growth-oriented sustainable development (CBD 2016). The Economics of Ecosystems and Biodiversity initiative views conventional economics as a powerful tool for biodiversity protection and attempts to promote discussion among mainstream economists and environmental and political scientists to jointly better inform environmental decision-making (Ring et al. 2010). In the Cancun Declaration, CBD promotes sustainable growth and reiterates the importance of mainstreaming biodiversity in economic sectors, such as agriculture, forestry, fisheries, and tourism, that directly and indirectly affect biodiversity (CBD 2016).

Economic growth is still being advocated in the most influential international policy documents on biodiversity and sustainability, hampering fundamental progress towards a more sustainable future (Otero et al. 2020). Consequently, it is time to revisit the global biodiversity agenda to ensure its coherence and improve its effectiveness (Büscher & Fletcher 2020).

### **Reorganizing Conservation in the Post-2020 Agenda**

A new international program for biodiversity conservation will be negotiated in the post-2020 GBF (CBD 2019, 2020). The 2050 Vision for Biodiversity, which is consistent with the 2030 Agenda and hence is growth oriented, serves as a roadmap of the post-2020 GBF for tackling species loss and restoring biodiversity (CBD 2018, 2019). For example, to halt and reverse biodiversity loss, the Zero Draft encourages implementation of the 2030 Agenda and the SDGs, sustainable use of biodiversity, and ecosystem services maintenance (CBD 2020). Likewise, the UNEP's *New Deal for Nature* calls for accounting for the true value of nature in line with the UN's GBEG milestone, mainly considering the economic value of natural capital and nature's role in supporting economic activity (UNEP 2019).



The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC) propose moving from the paradigm of economic growth towards a more sustainable global economy (IPBES 2019; IPBES-IPCC 2021). The update of the Zero Draft of the post-2020 GBF also recognizes that urgent policy action is required globally, regionally, and nationally to transform economic, social, and financial models (CBD 2020). The change in the outlook on growth in these documents marks a significant tipping point in the stance of biodiversity policies and assessments of economy-environment relationships. This change is a rare exception, and is found only in the UN Report *Global Biodiversity Outlook 4* (SCBD 2014). In the subsequent UN Report *Global Biodiversity Outlook 5*, the arguments for economic model transformation are peripheral (SCBD 2019).

The post-2020 GBF neglects the consequences of growth for biodiversity loss and over the next decade focuses on three topics: formulation and description of the goals defined in the Zero Draft, with emphasis on species conservation but not preventing further extinctions (CBD 2020a; Williams et al. 2020); establishment of measurable, realistic, unambiguous, and scalable metrics to effectively detect biodiversity changes and species extinctions and measure changes in the “health” of the biota (Mace et al. 2018; Rounsevell et al. 2020); and implementation of more ambitious post-2020 area-based conservation measures (Visconti et al. 2019; Bhola et al. 2020).

According to the area-based conservation measures and the amount of land and sea that needs to be set aside from production (Phalan et al. 2011; Donaldson et al. 2017; Gasparatos et al. 2017), at least 44% of land (Allan et al. 2019) and 26-41% of the ocean (Jones et al. 2020) require effective conservation attention. As a result, the Nature Needs Half agenda (Locke 2013; Cafaro et al. 2017; Kopnina et al. 2018) and the Half-Earth proposal (Wilson 2016) have been cited in an attempt to meet the Aichi Target 11 of turning half of the planet into a series of interconnected protected areas (PAs). The “Nature Needs Half” agenda and the “Half-Earth” proposal build on and argue for expansion and improvement of PAs, whose placement, management, funding, and representativeness are inadequate (Díaz et al. 2019; Stokstad 2020). Other area-based initiatives, such as the 30 x 30, strive to have 30% of all land and sea protected by 2030 (Waldron et al. 2020). All these proposals have influenced a Global Deal for Nature aiming to conserve 30% of Earth’s surface by 2030 and half of the planet by

2050 within the framework of the Paris Agreement (Watson & Venter 2017; Dinerstein et al. 2019). They also inform the post-2020 GBF, particularly through the 30x30 framework, which has been included in the action-oriented targets for 2030 of the updated Zero Draft (CBD 2020, Target 2).

The Whole Earth plan, a more holistic initiative for moving away from growth-oriented strategies to reach a socially and ecologically functioning socioeconomic system, has been proposed. This strategy is an alternative to the above-mentioned Half-Earth plans; it questions the extent to which conserving half the earth is feasible or just (Büscher et al. 2017). The Whole Earth strategy has led to the emergence of heated debates on how conservationists deal with capitalism (Büscher et al. 2017a; Cafaro et al. 2017; Kopnina et al. 2018). The different conservation strategies have caused rifts between conservationists against economic growth who are seeking to divorce conservation from capitalistic logics and those seeking conservation through growth.

### **Towards Sustainable Degrowth**

There are many challenges in the complex relationship between conservation and capitalist development and “saving nature” in the Anthropocene; many nuances, consensus, contradictions, and complexities coexist (Piccolo et al. 2018; Sandbrook et al. 2019; Büscher & Fletcher 2020). The different views on the importance and benefits of conservation to people, the economic valuation of biodiversity, social and science implications of conservation, and conservation’s relation to capitalism have been analyzed in depth (Kopnina et al. 2018; Sandbrook et al 2019; Büscher & Fletcher 2020).

We suggest conservationists liaise with political ecologists and ecological economists to underline the problems and contradictions in the relationship between growth and biodiversity. We argue here that capitalism’s metabolism is not compatible with an economy that respects the limits of the biosphere. The negative impact of economic growth on biodiversity is evident in the literature, and environmental and biodiversity conservation programs grounded in economic growth are ineffective. To ensure growth, continuous extraction of value from and commodification of nature is required to safeguard the capital, which in itself constitutes one of the most critical contradictions of capitalism. A capitalist economy not only exhausts the material basis for its reproduction, but also deteriorates the biophysical conditions that enable life on Earth (Foster et al., 2010; Harvey, 2014; Moore, 2015).

Capitalism's commodification of nature and its derived conservation policies, such as payments for ecosystem services and biodiversity offsets, will result in perpetuating the growth-based status quo.

By synthesizing the main findings of the existing research on the contradictions between growth and biodiversity conservation, we add to the conservation science literature an important argument to take into account during the negotiations of the post-2020 GBF. One of the main challenges to be faced by society in the 21<sup>st</sup> century is not biodiversity conservation itself but the need to restructure the current socioeconomic metabolism in such a way it is not driven by the logic of profit and growth through the destruction of nature and human lives. If this is not done, it will be difficult to stop biodiversity loss and ecosystem destruction and the resulting environmental and social damages. It is necessary to urgently reconvert the socioeconomic system into one that pursues an ecologically and socially healthier society.

The socioecological crisis demands urgent transformative action (Díaz et al. 2019; IPBES-IPCC 2021) to move humanity away from the paradigm of economic growth, as stated in emerging research on nongrowth-oriented social transformation in the conservation literature. Büscher et al. (2017) postulate that “we need to recognize that it is ultimately economic growth itself that is the root cause of biodiversity loss and hence to take the possibilities of degrowth economics seriously.” Büscher and Fletcher (2020) develop revolutionary ideas for conservation that help one think and completely reframe the question of biodiversity conservation. They state that “if conservation is tied to capitalism and capitalism necessitates growth, then degrowth, in its more radical incarnation, means moving beyond capitalism and hence should have profound consequences for conservation.” Fletcher et al. (2020a) propose a global green new deal for conservation grounded in the need for an overarching structural shift to a postgrowth society that “given capitalism's systemic imperative to incessant growth requires the liberating prospect of transcending capitalism, as well as the statism and patriarchy with which it is associated.” Sandbrook et al. (2020) argue for a post-Covid, transformative, economic reconstruction that questions growth; involves adopting a long-term vision; and accepts short-term costs, such as losing some conservation funds, projects, and even organizations dependent on unsustainable aspects of the pre-COVID-19 economic model. Otero et al. (2020) propose a nongrowth scenario to support this transition and “recommend that in the negotiations of

the next CBD Conference of the Parties and in future assessments of the IPBES, endorsement of economic growth is replaced by at least a precautionary recognition that it can be problematic for biodiversity.” In turn, IPBES states that the focus of their work is not on a single scenario but on a diversity of human-nature relationships and positive visions of the future post-2020 framework that ultimately enables transformative change (Lundquist et al., 2020).

It is necessary for the world’s nations to move towards a less material-based and more social-service-oriented economy. This model leads toward new societal goals, beyond GDP, and will improve both human and nature’s well-being, as is proposed in the first IPBES-IPCC co-sponsored workshop report on biodiversity and climate change (IPBES-IPCC 2021). There is a need to change the functioning of financial, political, academic, and social institutions. A better future can be achieved through a democratic and redistributive downscaling of the biophysical size of the global economy by means of sustainable degrowth (Schneider et al 2010, Kallis 2011), rather than economic decline leading to capitalist crises responsible for recessions and deterioration of social conditions. Such an equitable downscaling should be grounded in reversing the deterioration of the planetary resource base and the consequent environmental degradation. Mainstreamed in conservation policies and plans, a sustainable degrowth strategy would effectively halt biodiversity loss and enhance ecological conditions, while improving human well-being. Sustainable degrowth would also help humanity adapt to a future with fewer resources and more social conflicts. Limits to growth need to be taken into account on a planet with finite resources, as does limited ecological and social carrying capacity; pursuing efficiency gains is not enough. In addition to these general suggestions, we also argue for and provide in Table 1 specific guidelines for a sustainable, degrowth-based biodiversity conservation strategy (Table 1).

We encourage inclusion of new societal goals in the conservation agenda centered on building a more inclusive, safe, and just society. Conviviality (Fletcher et al. 2020a), ethical respect for nature (Martin et al. 2016), fairer trade rules (McElwee et al. 2020), and conservation basic income (Büscher & Fletcher 2020) have to become pillars of policies aimed at protecting biodiversity. Nature decommodification is imperative (Gerber & Gerber 2017) and a concept that needs to be included in the post-2020 GBF. Society needs to move away from the widespread accepted idea of the economy

at the center toward a more peaceful but radical one of life at the center. We argue strongly for transcending capitalism in its treatment of natural capital, sustainable development, and economic growth in the post-2020 GBF and the Paris Agreement and for setting up new sustainable prosperity goals without growth as the focus (Jackson 2009). It is time to transcend capitalism and find other ways of social organization and development that are ecologically and socially healthier. It is thus fundamental to clearly understand and better determine the relationship between capitalism and growth, how this relationship affects biodiversity conservation, and whether conservation has long played an essential role in the development of global capitalism (Büscher & Fletcher 2020), especially in the future context of uncertainty after (or with) COVID-19, where a more resilient socioeconomic system is needed and as more environmental awareness emerges in society. The climate emergency and the impending need for an energy transition cannot serve as an excuse to keep destroying biodiversity through development of extensive new technological solutions by transnational corporations in developing countries with biodiversity hotspots.

Whether capitalism, as a system needing continual growth to remain secure, will be capable of reorienting itself around degrowth concepts (D'Alisa et al. 2015) or whether an alternative economic system will be required (Corneo 2017) is a pivotal question for the upcoming post-2020 GBF of the CBD, which will set the conservation agenda for at least a decade to come. We hope we have provided some guidance on the path to sustainable degrowth and that our analysis serves as an impetus of the transformative action needed. If immediate action is not taken, environmental destruction and biodiversity losses will soon become irreversible.

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Table 1. Guidelines for a sustainable degrowth-based conservation strategy in the post-2020 Global Biodiversity Framework.

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1. Expand biodiversity conservation policy toward integration of biodiversity into all policies.
  2. Acknowledge the connection between a growth-oriented economy and the loss of biodiversity.
  3. Avoid market-based mechanisms (e.g., payments for ecosystems services and biodiversity offsets) and the commodification of biodiversity as fundamental mechanisms for biodiversity conservation.
  4. Shift conservation of biodiversity from a biological approach to a transdisciplinary approach, merging conservation biology with critical social sciences.
  5. Adopt a critical ecological economics approach that includes the sociopolitical dimensions of biodiversity conservation, transcending the mainstream economic-principles-related dimensions of natural capital, monetary valuation of nature, and its financialization and hence the logic of profit.
  6. Move away from the biodiversity conservation paradigm based on preserving “pieces of untouched nature” to a new paradigm based on a postcapitalist transformation of the economy, viewing the socioeconomic system as part of the biosphere to effectively address biodiversity loss.
  7. Halt and prohibit globally activities that cannot be socioecologically transformed to reverse the environmental deterioration of the planetary resource base and the consequent environmental degradation to build a more inclusive, safe, and just society.
  8. Develop nonmarket-based instruments for protecting biodiversity, such as a basic income for conservation, community-based conservation, and engaged visitation, instead of touristic voyeurism, etc.
  9. Democratize radically the decision-making processes in conservation policies and enhance the dialogue among scientists, Indigenous peoples, and social movements.
  10. Integrate biodiversity conservation within a broader approach to protecting biocultural diversity, thus preserving and enhancing the activities and communities coevolving with biodiversity (e.g., agroecological farming and Indigenous communities).
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